URBANIC ORGANIC - Solar Algae Trees

MOOD BOARD

The Urbanic Organic concept was born from the idea of experimenting, researching and designing. Since our cities are in constant change, our task is not only to produce designs that fulfill a sport-play-stay function, but also to further develop new tools and solutions that help us adapt to different climate changes and for which we should find acceptance in practice.

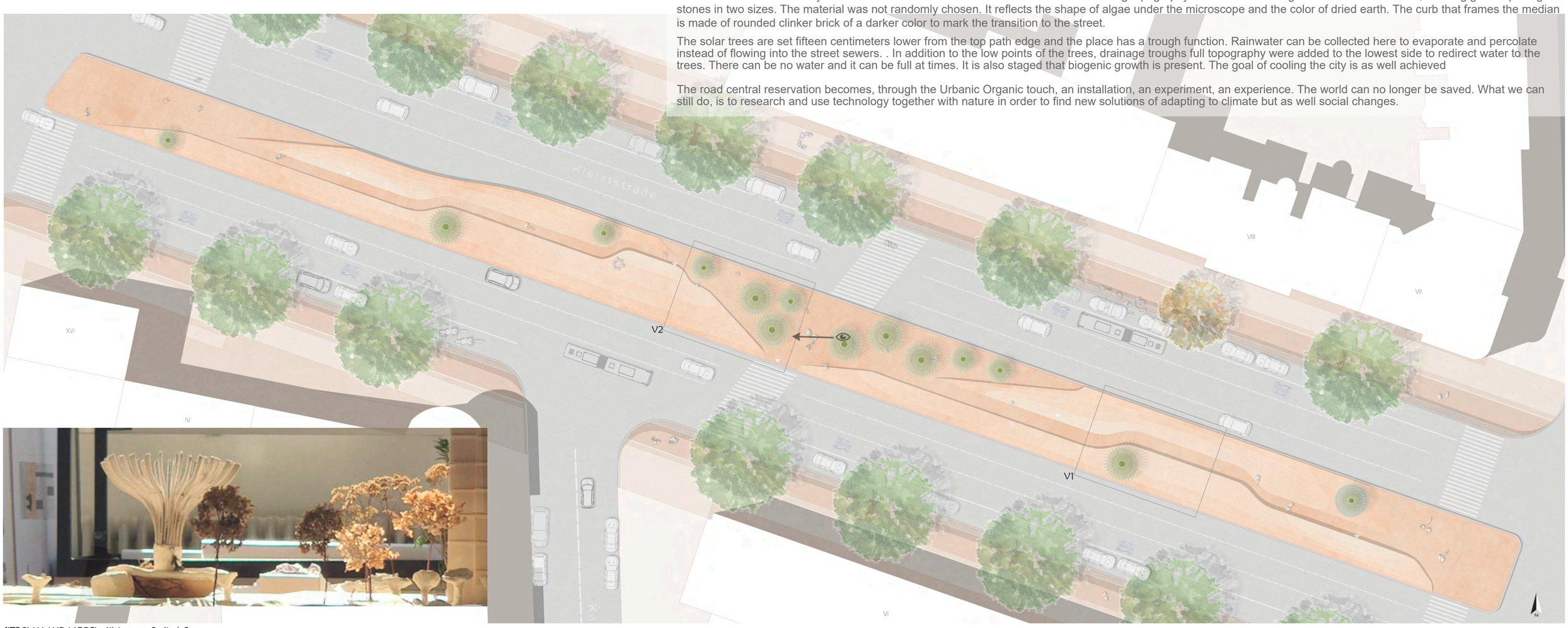
For this reason, together with its difficult positioning, in the middle of a busy street, above the subway, I chose as a theme for the design, the experimental symbiosis between natural resources and urban space. Exchanges between the actors sun, rainwater and topography make processes visible and tangible for residents and passers-by.

More and more trees are dying in cities from the lack of water and the temperature is rising faster in summers even in Germany. Because of the placement of the area above the subway, tree planting is limited here. Therefore, Photobioreactors in the form of artificial trees were visualized as an urban experimental alternative to transform CO2 from the air and create oxygen with the purpose of cleansing air.
Photobioreactors are cultivation systems designed for growing photoautotrophic organisms as microalgae using solar light to facilitate photosynthesis or using artificial light sources. The process is possible only by storing the CO_2 and mixing it with air bubbles, water and nutrients. Besides the properties of generating CO_2 into O_2 through photosynthesis, the algae trees give even more back. They provide shade in the hot summer days and generate energy to light up the place at night. At the same time, the light serves as heat for the algae at night. Artificial heat is installed for the cold winter days.

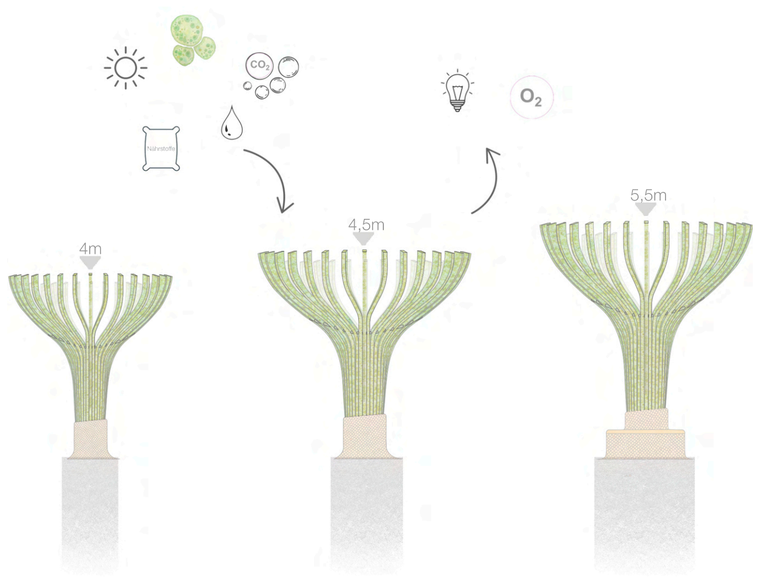
The algae trees can be found in two sizes and three heights. Each tree has thirty-two panels of anti-reflective glass. The tree trunk serves as protection for the Photobioreactor technical system. The tree trunk melts with the sidewalk and the waving topography. The whole covering consists of one material, bending granite paving stones in two sizes. The material was not randomly chosen. It reflects the shape of algae under the microscope and the color of dried earth. The curb that frames the median is made of rounded clinker brick of a darker color to mark the transition to the street.

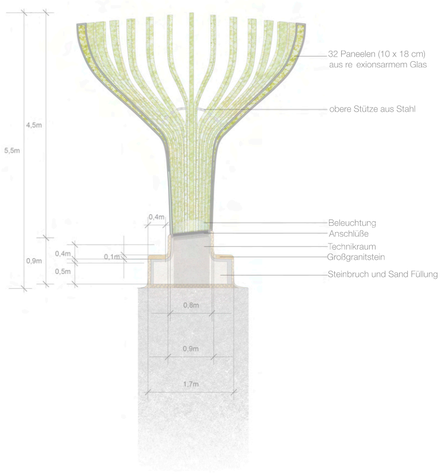
The solar trees are set fifteen centimeters lower from the top path edge and the place has a trough function. Rainwater can be collected here to evaporate and percolate instead of flowing into the street sewers. . In addition to the low points of the trees, drainage troughs full topography were added to the lowest side to redirect water to the trees. There can be no water and it can be full at times. It is also staged that biogenic growth is present. The goal of cooling the city is as well achieved

The road central reservation becomes, through the Urbanic Organic touch, an installation, an experiment, an experience. The world can no longer be saved. What we can still do, is to research and use technology together with nature in order to find new solutions of adapting to climate but as well social changes.

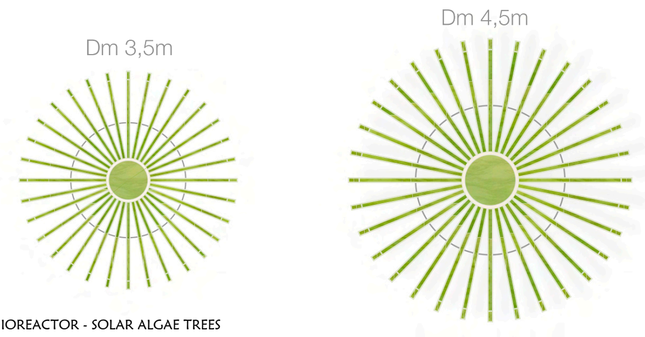


SITE PLAN AND MODEL - Kleiststreet, Berlin | Germany

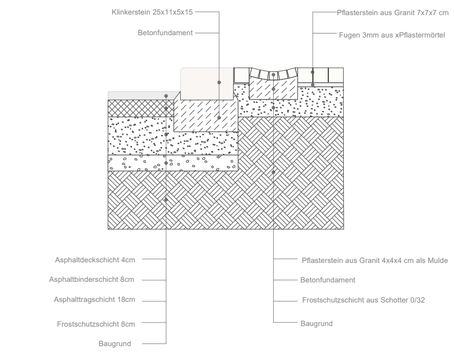




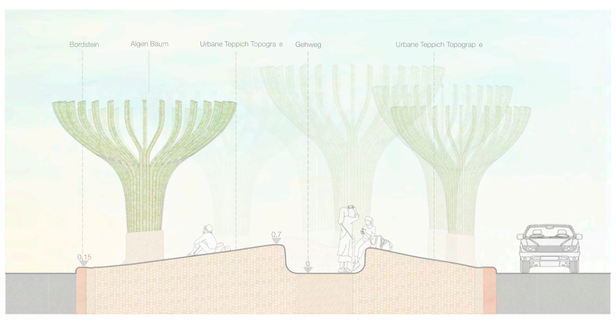
ALGAE TREE SECTION



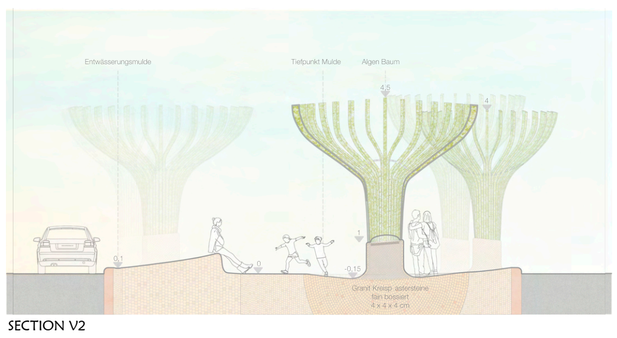
PHOTOBIOREACTOR - SOLAR ALGAE TREES



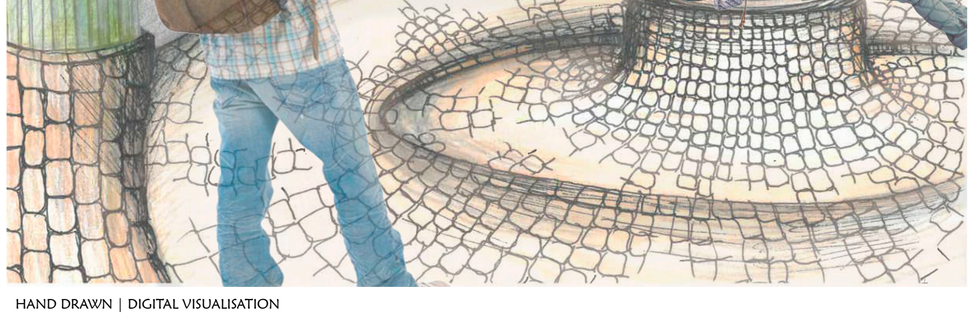
DETAIL CURB AND DRAINAGE TROUGH



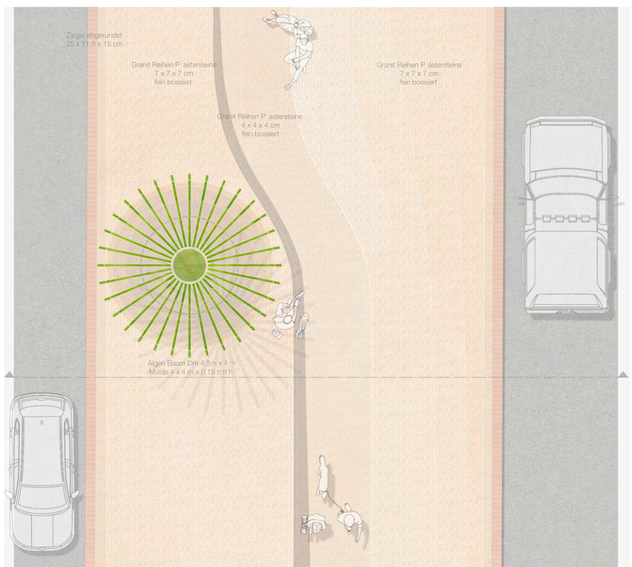
SECTION V1



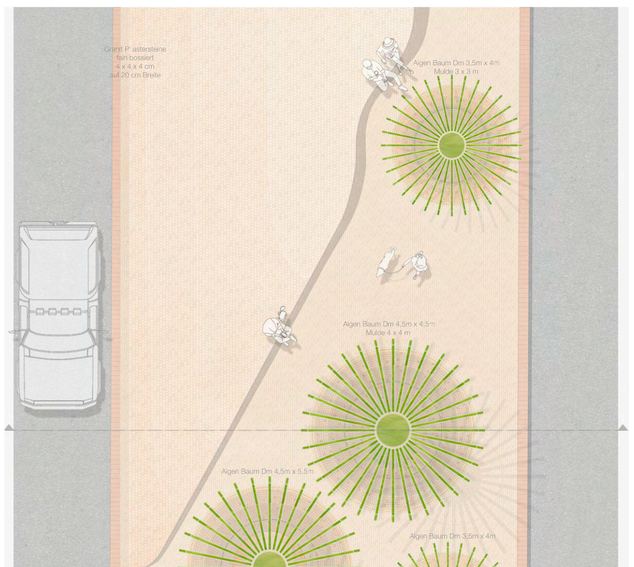
SECTION V2



HAND DRAWN | DIGITAL VISUALISATION



PLAN DETAIL V1



PLAN DETAIL V2

HAND DRAWN VISUALISATION